The relationship between Type D personality and insomnia

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Abstract

Objectives: Type D personality is characterised by the combination of social inhibition and negative affectivity. This study examined the relationship between Type D personality and insomnia symptoms amongst a sample of the general-population. *Methods:* Adults from the general-population (n=392) completed online measures of Type D personality (DS14) and insomnia severity. *Results:* Individuals with the Type D personality trait reported significantly greater symptoms of insomnia relative to Non-Type Ds. Moreover, insomnia-symptoms were independently related to negative affectivity (NA) and social inhibition (SI) and the Type D interaction (i.e. synergistic product of SI and NA). Linear regression analysis determined that NA but not SI significantly predicted insomnia symptoms after controlling for age and sex. However, after accounting for the Type D interaction, negative affectivity remained the only significant predictor of insomnia-symptoms. *Conclusions:* The Type D personality type appears to be related to insomnia-symptoms, both as a categorical and dimensional construct. These outcomes support prior research evidencing that whilst Type D personality is related to poor sleep in adolescents, NA appears to be the main contributor.

Introduction

Insomnia is influenced by a number of predisposing, precipitating and perpetuating factors, which are behavioural, biological, environmental, or psychological in nature (1). At symptom level, insomnia is highly prevalent, affecting up to 30% of the general population (2,3). An individual's personality may act as a predisposing, and potentially perpetuating, factor of the disorder. Indeed, literature concerning personality concurs that individuals with insomnia exhibit increased neuroticism, internalization, anxious concerns, and negative components of perfectionism (4-7). However, research concerning the relationship between Type D personality and sleep difficulties remains limited (8), with no research to date examining the specific role of insomnia symptoms within the general population.

Type D personality, also known as the *distressed personality*, indicates a joint tendency to experience negative emotions whilst also inhibiting self-expression in social interaction due to a fear of rejection or disproval by others(9). This personality type is characterised by the two stable traits: negative affectivity (NA) and social inhibition (SI) and it is proposed that it is specifically the synergistic combination of the two traits which is important (9). Type D personality has been associated with a range of negative health outcomes and increased psychological distress (e.g. 10-13). Therefore, considering the nature of Type D personality, and the relationships between personality traits associated with poor-sleep and insomnia (i.e. neuroticism, anxious concerns) (14-15), Type-D personality may theoretically also be related to insomnia. Indeed, amongst a sample of police officers and nurses, Type D personality has been determined as a significant predictor of sleep disturbances (16). More recently, Condén and colleagues (8) determined that adolescents with Type-D personality were at a four times increased risk of having sleep disturbances and reduced total sleep time. Further, associations between Type D personality and sleep problems have also recently been demonstrated in cardiac patients (17,18).

Type D personality was traditionally conceptualised as a categorical variable with individuals scoring above a threshold on both SI and NA are classified as Type D (9), however recent recommendations propose that it is alternatively represented as a dimensional construct (13,19). Therefore, in line with previous studies (e.g.13) Type D will be considered as both a categorical and a continuous variable within the current study. Whilst Type D personality may act as a marker for disturbed sleep amongst adolescents(8), cardiac patients (17,18), police officers and nurses (16), it has yet to be determined whether this extends to members of the general population presenting symptoms of insomnia. Therefore, the present study aimed to examine the relationship between Type D personality and insomnia symptoms amongst a sample of the general population. Specifically, we aimed to determine whether: i) individuals categorised as Type D report increased insomnia symptoms relative to their non-Type D counterparts; ii) dimensions of NA and SI are independently related to insomnia symptoms; and iii) the dimensional Type D construct may have a greater predictive value for insomnia symptoms, over and above that of NA and SI in isolation.

Based on the extant literature to date, we hypothesised that Type D personality would be related to increased symptoms of insomnia. Additionally, we aimed to explore regression analyses utilising the dimensional (NA x SI) interaction to determine the influence of Type D and its components on insomnia symptoms.

Method

Sample and Procedure

A cross-sectional online questionnaire based study was implemented comprising of questions designed to assess the relationship between Type D personality and insomnia symptoms. The study was approved by the Sheffield Hallam University Research Ethics Committee, and all participants provided informed consent.

The survey was advertised to members of the general population through social media, 'call for participants' (website), and students at four Northern UK universities, through each institutions course participation scheme. 459 participants began the survey, and 430 respondents provided complete data. Those who indicated that they conducted shift work, suffered from a disorder of the central nervous system, were currently using medication which effects sleep, or had a prior head injury or reported symptoms of a sleep disorder other than insomnia were excluded from analysis (n=38). This resulted in a final sample of 392 participants (mean age=23.22±9.87, range 18-76, 75% female). Of note, standard cut-offs of the SLEEP-50 questionnaire (20) was used to ensure the absence of a sleep/wake disorder other than insomnia. (see 'Measures' for details).

Measures

Type D personality was assessed using the 14-item DS14 (9). Specifically, this measure comprises two 7-item subscales to measure NA (e.g. "I often feel unhappy") and SI (e.g. "I am a closed kind of person") with a maximum score of 28 on each scale. Each item is measured on a 5-point Likert scale: (0=false), (1=mostly false), (2=neutral), (3=mostly true), (4=true). Traditionally, Individuals who score high on both subscales represented by a cut-off $\geq$10 are classified as Type D (9). In order to analyse Type D as a dimensional construct, a continuous measure of Type D was computed using the arithmetic product of SI and NA scores. This is in line with recent studies examining the dimensional Type D construct (e.g. 13). Assessment of internal consistency yielded a Cronbach's alpha of .91 for NA and .87 for SI.

Insomnia symptoms were assessed using The Insomnia Severity Index (20) The ISI consists of 7 items examining the severity of insomnia symptoms over the past two weeks including difficulty initiating and maintaining sleep, and awakening too early. Items are scored on a 5-point likert scale, with total scores ranging from 0–28. Higher scores represent greater insomnia severity. Assessment of internal consistency yielded a Cronbach's alpha of .87.

Subscales of the SLEEP-50 (21) ensured the absence of: apnoea, sleepwalking, narcolepsy, restless legs syndrome/periodic limb movement, and circadian rhythm disorder. The SLEEP-50 consists of fifty items; in the current study items relating to insomnia (assessed by the ISI) or sleep hygiene (not a sleep disorder) were omitted. The participants were asked to rate to what extent the items have been applicable in the past month (0=not at all, 4=very much). An example item is: "I am told that I wake up gasping for air". Total scores of: ≥15 indicate apnea; ≥7 sleepwalking; ≥7 narcolepsy; ≥7 restless legs syndrome/periodic limb movement; and ≥8 a circadian rhythm disorder.

Statistical Analyses

An Independent samples t-test was used to determine any significant difference in the severity of insomnia symptoms between Type D and Non-Type Ds. Moreover, Pearson's bivariate correlational

analyses examined the influence of NA, SI and the dimensional Type D interaction (NAxSI) on insomnia symptomology. Finally, hierarchical linear regression analyses (using the enter method) determined whether Type D demonstrated greater predictive value than that of NA and SI considered in isolation. Specifically, age and sex were entered as predictors in step 1; NA and SI in step 2; and the Type D (NA×SI) interaction in step 3. Significance was considered at the $p<.05$ level.

Results

Mean scores for the final sample were as follows: ISI, 8.97±5.51; NA, 12.86±6.91; SI, 12.09±6.60; and the continuous Type D interaction (NAxSI), 181.29±163.99.

Participants were stratified into Type D individuals (n=200, mean age=22.02±7.54, 79% female) and Non Type Ds (n=192, mean age=24.12±11.50, 71% female) for the categorical analysis. The results from this demonstrated that individuals categorised as Type D reported a significantly higher ISI score (10.51±5.35) relative to Non-Type Ds (7.24±5.15: t(390)=-6.15,p=.001).

Pearsons correlational analyses indicated that ISI scores were independently related to NA ($r=.42$,$p<.001$) SI ($r=.25$,$p<.001$) and the Type D interaction (SA x NI: $r=.38$,$p<.001$). Moreover, linear regression analysis determined that negative affectivity but not social inhibition significantly predicted insomnia symptoms (step2: 18% total variance explained after controlling for age and sex (step1: 0.05%variance). Interestingly, after accounting for the Type D interaction, NA remained the only significant predictor of ISI score (step3: 19%variance).

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Discussion

The present study aimed to examine the relationship between Type D personality and insomnia symptoms amongst a sample of the general population. Our results provide evidence that the Type D personality type is related to symptoms of insomnia, both as a categorical and dimensional construct. Specifically, using the traditional cut-off (9), those characterised as Type D reported greater symptoms of insomnia relative to non-Type D individuals. Additionally, NA, SI and the multiplicative product of these two components were all independently related to symptoms of insomnia. Interestingly, negative affectivity appeared to be the only predictor of insomnia symptoms when NA, SI, and Type D were entered into the regression model, similarly to a recent dimensional analysis of the relationship between Type D and physical symptoms (13). That said, whilst social inhibition was not a significant predictor in the final model, the contribution of the NAxSI interaction was not far from significant. As such, this tentatively suggests that the synergistic effect of the two components contribute to symptoms of insomnia, thus further supporting the categorical analyses. This further exemplifies the merit of the categorical approach as a predictor for negative outcomes, supporting recent research in the area (22). These outcomes support previous research which determined that whilst Type D personality is related to increased sleep-disturbances in adolescents, negative affectivity appears to be the main contributor (8). Here, however we confirm that this pattern of results extends to adult members of the general population presenting symptoms of insomnia after controlling for the presence of other sleep disorders.

From a cognitive perspective, central to the maintenance of the disorder is the presence of negatively toned cognitive activity, predominantly characterised as worry and rumination in relation to sleep (23). Despite differences in temporal orientation of these factors (i.e. worry is future-oriented; rumination past-oriented), both involve recurring negatively-valenced thoughts (24). For example, rumination may involve thoughts such as *"because I did not sleep last night I cannot concentrate today"*, whereas worry would encompass thoughts such as *"because I feel anxious I will not be able to sleep tonight"*(25,26). The Type D personality type indicates individuals who are particularly vulnerable to the negative consequences of general distress(27). In this context, worry and rumination relating to sleep may be heightened amongst those with this predisposition, in particular those high in negative affectivity.

The present sample was mostly female, and therefore the outcomes may not be entirely generalizable to males. That said, this is in agreement which research showing that women are more likely to experience insomnia and report the Type D personality type relative to men (8,28). The mean age of the sample was also relatively low, suggesting the outcomes may also not generalize to the older population. It is therefore suggested that future studies should employ a larger heterogeneous sample. Nevertheless, the current study extends our knowledge of the relationship between Type D and sleeping problems in a non-clinical sample. Moreover, whilst a comprehensive assessment to address insomnia symptoms from the perspective of diagnostic criteria was used, the current outcomes cannot be extrapolated to individuals meeting diagnostic criteria for insomnia. Further, given the cross-sectional design, the causality of the relationships identified cannot be conclusively defined.

Overall, we expand on previous research using adolescents (8), cardiac patients (17,18), or specialised populations by highlighting the relationship between Type D personality and insomnia symptoms in the general population. Considering this personality-type may act as a predisposition for future illness (9) (e.g. insomnia), research may wish to address targeted sleep interventions for those who indicate the *distressed* personality type.

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